Computer, Automated Teller, and Office Machine Repairers

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Significant Points

- Workers qualify for these jobs by receiving training in electronics from associate degree programs, the military, vocational schools, equipment manufacturers, or employers.

- Job growth reflects the increasing dependence of business and residential customers on computers and other sophisticated office machines.

- Job prospects will be best for applicants with knowledge of electronics, as well as repair experience; opportunities for computer repairers should be excellent, given that employers are reporting difficulty finding qualified applicants.

Nature of the Work

Computer repairers, also known as *computer service technicians or data-processing equipment repairers,* service mainframe, server, and personal computers; printers; and disc drives. These workers perform primarily hands-on repair, maintenance, and installation of computers and related equipment. Workers who provide technical assistance, in person or by telephone, to computer system users are known as computer support specialists or computer support technicians. (See the statement on computer support specialists and systems administrators elsewhere in the *Handbook.*)

Automated teller machines (ATMs) allow customers to carry out bank transactions without the assistance of a teller. ATMs now provide a growing variety of other services, including stamp, phone card, and ticket sales. *Automated teller machine servicers* repair and service these machines.

Office machine and cash register servicers work on photocopiers, cash registers, mail-processing equipment, and fax machines. Newer models of office machinery increasingly include computerized components that allow them to function more effectively than earlier models.

To install large equipment, such as mainframe computers and ATMs, repairers connect the equipment to power sources and communication lines that allow the transmission of information over computer networks. For example, when an ATM dispenses cash, it transmits the withdrawal information to the customer's bank. Workers also may install operating software and peripheral equipment, checking that all components are configured to function together correctly. The installation of personal computers and other small office machines is less complex and may be handled by the purchaser.

When equipment breaks down, many repairers travel to customers' workplaces or other locations to make the necessary repairs. These workers, known as *field technicians*, often have assigned areas in which they perform preventive maintenance on a regular basis. *Bench technicians* work in repair shops located in stores, factories, or service centers. In small companies, repairers may work both in repair shops and at customer locations.

Computer repairers usually replace subsystems instead of repairing them. Replacement is common because subsystems are inexpensive and businesses are reluctant to shut down their computers for time-consuming repairs. Subsystems commonly replaced by computer repairers include video cards, which transmit signals from the computer to the monitor; hard drives, which store data; and network cards, which allow communication over the network. Defective modules may be given to bench technicians, who use software programs to diagnose the problem and who may repair the modules, if possible.

When ATMs malfunction, computer networks recognize the problem and alert repairers. Common problems include worn magnetic heads on card readers, which prevent the equipment from recognizing customers' bankcards, and "pick failures," which prevent the equipment from dispensing the correct amount of cash. Field technicians travel to the locations of ATMs and usually repair equipment by removing and replacing defective components. Broken components are brought to a repair shop, where bench technicians make the necessary repairs. Field technicians perform routine maintenance on a regular basis, replacing worn parts and running diagnostic tests to ensure that the equipment functions properly.

Office machine repairers usually work on machinery at the customer's workplace; alternatively, if the machines are small enough, customers may bring them to a repair shop for maintenance. Common malfunctions include paper misfeeds, due to worn or dirty parts, and poor-quality copy, due to problems with lamps, lenses, or mirrors. These malfunctions usually can be resolved simply by cleaning the relevant components. Breakdowns also may result from the failure of commonly used parts. For example, heavy usage of a photocopier may wear down the printhead, which applies ink to the final copy. In such cases, the repairer usually replaces the part instead of repairing it.

Workers use a variety of tools for diagnostic tests and repair. To diagnose malfunctions, they use multimeters to measure voltage, current, resistance, and other electrical properties; signal generators to provide test signals; and oscilloscopes to monitor equipment signals. To diagnose computerized equipment, repairers use software programs. To repair or adjust equipment, workers use handtools, such as pliers, screwdrivers, soldering irons, and wrenches.

Working Conditions

Repairers usually work in clean, well-lighted surroundings. Because computers and office machines are sensitive to extreme temperatures and to humidity, repair shops usually are air conditioned and well ventilated. Field repairers must travel frequently to various locations to install, maintain, or repair customers' equipment.
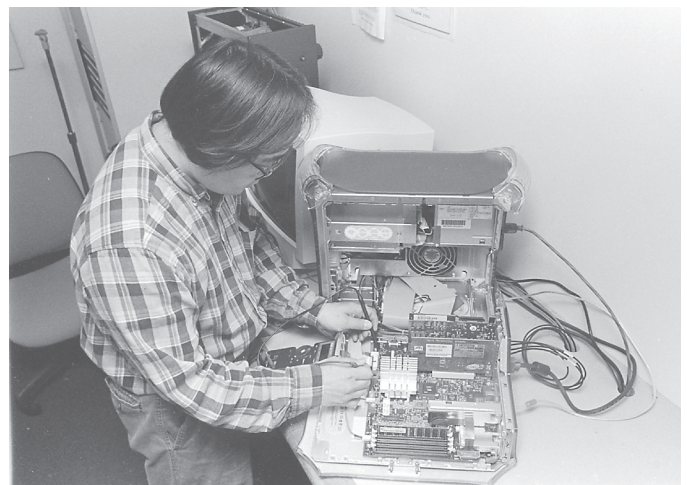
Computer repairers usually replace defective components, such as video and network cards, instead of repairing them.

ATM repairers may have to perform their jobs in small, confined spaces that house the equipment.

Because computers and ATMs are critical for many organizations to function efficiently, data-processing equipment repairers and ATM field technicians often work around the clock. Their schedules may include evening, weekend, and holiday shifts, sometimes assigned on the basis of seniority. Office machine and cash register servicers usually work regular business hours because the equipment they repair is not as critical.

Although their job is not strenuous, repairers must lift equipment and work in a variety of postures. Repairers of computer monitors need to discharge voltage from the equipment to avoid electrocution. Workers may have to wear protective goggles.

Employment

Computer, automated teller, and office machine repairers held about 156,000 jobs in 2002. Wholesale trade establishments employed about one-third of the workers in this occupation; most of these establishments were wholesalers of professional and commercial equipment and supplies. Many workers also were employed in electronics, appliance, and office supplies stores. Others worked in electronic and precision equipment repair shops and computer systems design firms. A small number were found in computer and peripheral equipment manufacturing, government agencies, and internet service providers. About 1 computer, automated teller, and office machine repairer in 8 was self-employed, more than twice the proportion for all installation, maintenance, and repair occupations.

Training, Other Qualifications, and Advancement

Knowledge of electronics is necessary for employment as a computer, automated teller, or office machine repairer. Employers prefer workers who are certified as repairers or who have training in electronics from associate degree programs, the military, vocational schools, or equipment manufacturers. Employers generally provide some training to new repairers on specific equipment; however, workers are expected to arrive on the job with a basic understanding of equipment repair. Employers may send experienced workers to training sessions to keep up with changes in technology and service procedures.

Most office machine and ATM repairer positions require an associate degree in electronics. A basic understanding of mechanical equipment also is important, because many of the parts that fail in office machines and ATMs are mechanical, such as paper loaders. Entry-level employees at large companies normally receive on-the-job training lasting several months. Such training may include a week of classroom instruction, followed by a period of 2 weeks to several months assisting an experienced repairer.

Field technicians work closely with customers and must have good communications skills and a neat appearance. Employers normally require that field technicians have a driver's license.

Various organizations offer certification, including ACES International, the Computing Technology Industry Association, the Electronic Technicians Association International, and the International Society of Certified Electronics Technicians. Repairers may specialize in a variety of skill areas. To receive certification, repairers must pass qualifying examinations corresponding to their level of training and experience.

Newly hired computer repairers may work on personal computers or peripheral equipment. With experience, they can advance to positions maintaining more sophisticated systems, such as networking equipment and servers. Field repairers of ATMs may advance to bench-technician positions responsible for more complex repairs. Experienced workers may become specialists who help other repairers diagnose difficult problems or who work with engineers in designing equipment and developing maintenance procedures. Experienced workers also may move into management positions responsible for supervising other repairers.

Because of their familiarity with equipment, experienced repairers may move into customer service or sales positions. Some experienced workers open their own repair shops or become wholesalers or retailers of electronic equipment.

Job Outlook

Employment of computer, automated teller, and office machine repairers is expected to grow about as fast as the average for all occupations through 2012. Job growth will be driven by the increasing dependence of business and residential customers on computers and other sophisticated office machines. The need to maintain this equipment in working order will create new jobs for repairers. In addition, openings will result from the need to replace repairers who retire or transfer into new occupations.

Job prospects will be best for applicants with knowledge of electronics as well as repair experience; opportunities for computer repairers should be excellent, given that employers are reporting difficulty finding qualified applicants and that computers are increasingly being relied on. Although computer equipment continues to become less expensive and more reliable, malfunctions still occur and can cause severe problems for users, most of whom lack the knowledge to make repairs. Computers are critical to most businesses today and will become even more so to companies that do business on the Internet and to households that bank, pay bills, or make purchases online.

People also are becoming increasingly reliant on ATMs. Besides offering bank and retail transactions, ATMs provide an increasing number of other services, such as employee information processing and distribution of government payments. Improvements in ATM design have increased reliability and simplified repair tasks, reducing the number and extent of repairs. Opportunities for ATM repairers should be available, arising primarily from the need to replace workers who leave the specialty, rather than from employment growth.

Conventional office machines, such as calculators, are inexpensive, and often are replaced instead of repaired. However, digital copiers and other, newer office machines are more costly and complex. This equipment often is computerized, designed to work on a network, and able to perform multiple functions. The growing need for repairers to service such sophisticated equipment should result in job opportunities for office machine repairers.

Earnings

Median hourly earnings of computer, automated teller, and office machine repairers were $15.98 in 2002. The middle 50 percent earned between $12.44 and $20.38. The lowest 10 percent earned less than $9.99, and the highest 10 percent earned more than $25.06. Median hourly earnings in the industries employing the largest numbers of computer, automated teller, and office machine repairers in 2002 were as follows:

Computer systems design and related services	$17.33
Professional and commercial equipment and supplies merchant wholesalers	17.28
Office supplies, stationery, and gift stores	14.79
Electronics and appliance stores	13.89
Electronic and precision equipment repair and maintenance	13.46

Related Occupations

Workers in other occupations who repair and maintain electronic equipment include broadcast and sound engineering technicians and radio operators; electronic home entertainment equipment installers and repairers; electrical and electronics installers and repairers; industrial machinery installation, repair, and maintenance workers; and radio and telecommunications equipment installers and repairers.

Sources of Additional Information

For information on careers and certification, contact:

➤ ACES International, 5241 Princess Anne Rd., Suite 110, Virginia Beach, VA 23462. Internet: **http://www.acesinternational.org**

➤ Computing Technology Industry Association, 1815 S Meyers Rd., Suite 300, Oakbrook Terrace, IL 60181-5228. Internet: **http://www.comptia.org**

➤ Electronics Technicians Association International, 5 Depot St., Greencastle, IN 46135.

➤ International Society of Certified Electronics Technicians, 3608 Pershing Ave., Fort Worth, TX 76107-4527. Internet: **http://www.iscet.org**